REMARKS

Entry of the foregoing, reexamination and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 3, 16 and 22-28 were pending. By the present response, claim 16 is been amended and claims 29-33 have been added. Thus, upon entry of the present response, claims 3, 16 and 22-33 are pending and await further consideration on the merits.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: paragraph [0013]; Figures 1-2; and the original claims.

CLAIM REJECTIONS UNDER 35 U.S.C. §102

Claims 3, 16 and 22-28 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,278,400 to Yamarik et al. (hereafter "*Yamarik et al.*") on the grounds set forth on pages 5-6 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

The present invention is directed to a component of a fluid-flow machine. A component constructed according to the principles of the present invention provides both a construction that facilitates inspection as well as reducing the danger of blockage of coolant holes by dust or other debris in the coolant flow. According to the present invention, through a combination of careful sizing and positioning, an inspection access aperture can also serve as a dust discharge aperture, thereby eliminating unnecessary apertures which can lead to undesired loss of cooling

medium, thereby resulting in a loss of efficiency by the component. *See, e.g.* paragraph [0008] of the present specification.

A component constructed according to the principles of the present invention is set forth in claim 16. Claim 16 recites:

> *16. A component of a fluid flow machine, the component comprising:*
> *a leading edge and a trailing edge;*
> *a first coolant passage comprising at least one curved flow section configured to curve in a first flow direction to establish coolant medium flow in the first flow direction; and*
> *a second passage, the second passage (i) branching off the coolant passage at the curved flow section and (ii) being arranged to extend in the first flow direction along a flow path which is tangential to the curved flow section; and*
> *a dust discharge aperture in communication with the second passage having a longitudinal axis essentially parallel to an axis of the fluid flow machine, the dust discharge aperture arranged at the trailing edge of the component and dimensioned to enable the introduction of a borescope through the dust discharge aperture.*

Yamarik et al. fails to anticipate the component as set forth above in amended claim 16.

Yamarik et al. is directed to a coolable rotor blade having a cooling structure based upon multiple coolant flow supply paths. The rotor blade construction disclosed therein includes a number of coolant passages, including tip cooling holes 58 which are disposed in communication with the blade tip passage 56. In the grounds of rejection, both 56 and 58 are incorrectly referred to as "the second passage." As evident from the above, amended claim 16 requires a component having a construction which includes both "a second passage" as well as a "dust discharge aperture." The grounds rejection are deficient in that elements of the *Yamarik et al.* device are not clearly identified as corresponding to these features recited in amended claim 16.

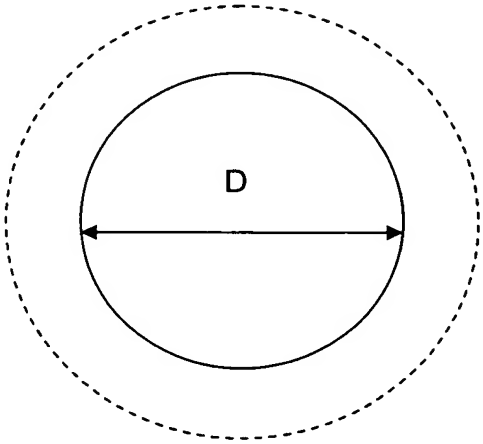
With respect to the tip passage 56, this passage does not constitute a dust discharge aperture of any kind whatsoever. With respect to the tip cooling holes 58, as evident from the above, claim 16 additionally requires that "the dust discharge aperture . . . dimensioned to enable the introduction of a borescope through the dust discharge aperture."

It is noted that on page 3 of the Official Action, the Examiner characterizes the aperture 58 as a "discharge hole." Applicants wish to point out that this characterization is that solely of the Examiner. *Yamarik et al.* never refers to the aperture 58 is anything other than "tip cooling holes" and "tip holes."

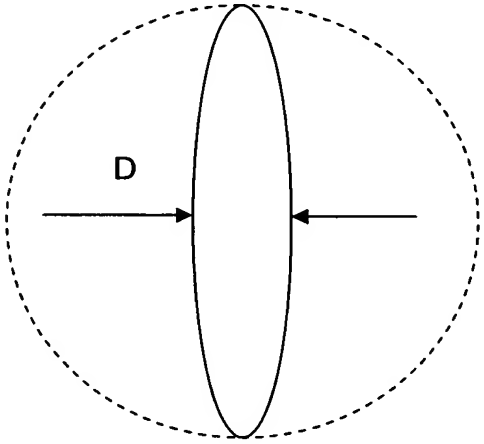
It is further alleged on page 3 of the Official Action that, with respect to hole 58, "said hole significantly larger than these other cooling holes." Again, Applicants wish to point out that this interpretation is solely that of the Examiner. There is absolutely no basis whatsoever in the express disclosure of *Yamarik et al.* to support this contention. Looking at the Figure of *Yamarik et al.* alone, one could make the argument that the hole 58 of *Yamarik et al.* has a different shape than round the cooling holes 56. This does not mean that the holes 58 are any larger, at least in the sense that they would more readily accept a borescope, than the holes 56.

It is noted that *Yamarik et al.* discloses a discharge slot 64 on the lower portion of the blade. Assuming, *arguendo*, that cooling hole 58 functions as a discharge hole, the shape of the hole 58 could presumably take a similar form, i.e., slot-like. It is respect resubmitted that a properly dimensioned cooling hole, albeit in a slot-like form, is not configured to more readily accept a borescope than a round cooling hole 56. The point is illustrated by the illustration below, assuming a

substantially round borescope end (broken line), wherein D is the access limiting dimension.



round holes
56



slot like holes
(58?), 64

Yamarik et al. contains no disclosure whatsoever to indicate that the tip cooling holes 58 are of suitable dimensions that would enable the introduction of a borescope therethrough. In addition, no explanation is been offered as to why the holes 58 are inherently dimensioned to accept a borescope, i.e., must necessarily be dimensioned so that they accept a borescope. *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 20 USPQ2d 1746, 1749-50 (Fed. Cir. 1991; *In re Oelrich*, 666 F.2d 578,581, 212 USPQ 323, 326 (C.C.P.A. 1981) ("inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient"); *Standard Oil Co. v. Montedison, S.p.A.*, 664 F.2d 356, 372, 212 USPQ 327, 341 (3d Cir. 1981) (for a claim to be inherent in the prior art it "is not sufficient that a person following the disclosure sometimes obtain the result set forth in the [claim]; it must

invariably happen"). When examined under the appropriate legal standards set forth above, it is readily apparent that the assertions of inherency contained in the grounds rejection clearly fail to establish a *prima facie* case of unpatentability.

It is asserted on page for the Official Action that "Yamarik clearly shows a flow that is tangential to the curved flow path in leading to the tip channel (56)." This assertion is respectfully traversed. Applicants respectfully request that the Examiner specifically identify where this is shown in the Figure of *Yamarik et al.*

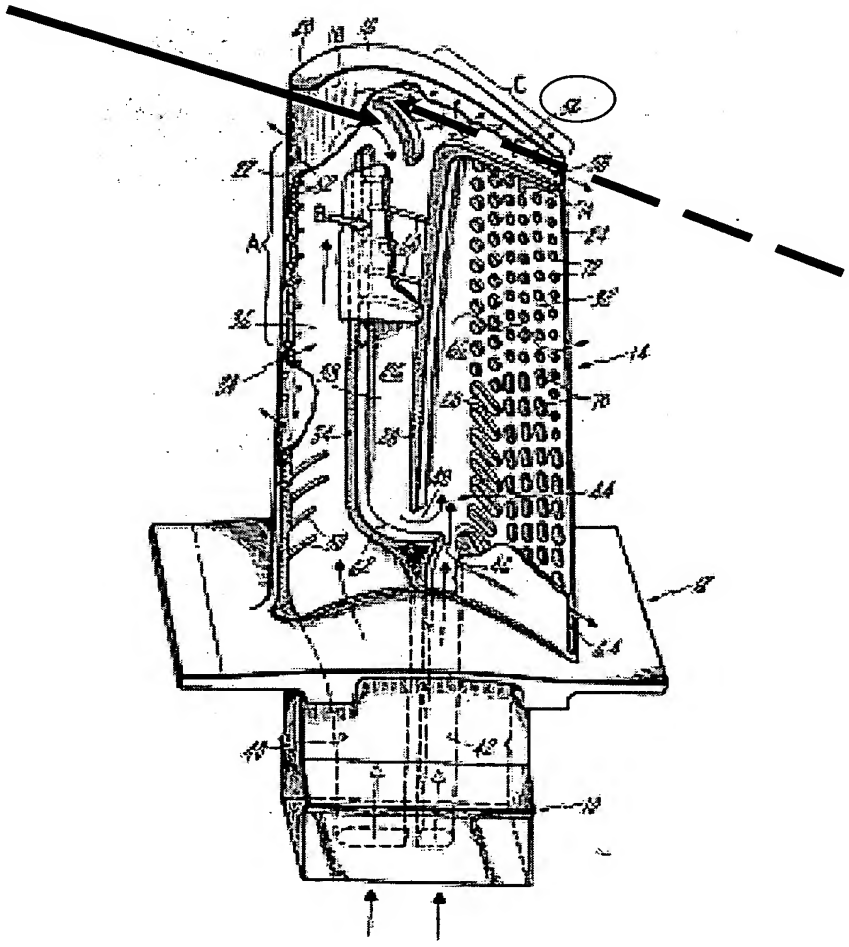
It is further alleged on page for the Official Action that "the dominating force acting on particles in the cooling path is not the flow direction, but the enormous centrifugal forced [sic: forces] due to the high rotational speeds of the blades." This assertion is respectfully traversed. As disclosed, for example, in paragraph [0015] of the present specification:

> The mechanism of dust extraction is the same as that in Fig. 1. In this example, the dirt particles, due to their inertia and a high flow speed of the deflected cooling medium, take the path via the channel 7 leading to the dust hole 5, while cooling medium is deflected at the branch without problems in the direction toward the machine axis and is therefore conducted, relatively dust-free, past the pins 6 to the cooling air apertures . . . .

Thus, the Examiner's theory concerning the inherent lack of particles in the primary flow path is incorrect.

Claim 16 also recites that "the second passage . . . being arranged to extend in the first flow direction along a flow path which is tangential to the curved flow section". As illustrated below, *Yamarik et al.'s* rotor blade shown in the Figure includes a curved flow path indicated by a curved arrow. The curved flow path extends from the leading edge flow region 30 to the cavity 26 defined between the forward baffle 34 and the rearward baffle 28. The tip passage 56 is not tangential to

this curved flow path because the turning vane 54 is positioned inside the rotor blade to guide the flow into the cavity 26, not in a direction tangential to the curved flow path as required by claim 16 (see, e.g., solid line arrow).



Thus, *Yamarik et al.* clearly fails to anticipate the component as defined by claim 16. Reconsideration and withdrawal of the rejection is respectfully requested. The remaining claims depend either directly or indirectly upon claim 16. Thus, these claims are also not anticipated by *Yamarik et al.* for at least the reasons noted above.

In addition, claim 24 requires, *inter alia*, "there is a straight line of sight from the dust discharge aperture through the second passage to the first portion of the third wall." Similarly, claim 25 requires "there is a straight line of sight through the second section to the first portion of the third wall." By contrast, and contrary to the assertions contained on page 3 of the Official Action, *Yamarik et al.* clearly fails to disclose a construction having the above-quoted "straight line of sight." The broken line arrow appearing in the drawing figure reproduced from *Yamarik et al.* above makes this abundantly clear. Thus, claims 24 and 25 are distinguishable over *Yamarik et al.* for at least these additional reasons.

As clearly shown in the Figure of *Yamarik et al.* reproduced above, the vane 54 necessarily obstructs the vast majority of the passage 56. Thus, the vane 54 obstructs any arguable line of sight through hole 58. The vane 54 would appear to greatly hinder the operation of a borescope inserted into the inner cooling structure of the blade of *Yamarik et al.* This represents yet another reason why the hole 58 of *Yamarik et al.* is not necessarily sized to accept a borescope. In other words, if a borescope could not be effectively utilized due to the inner cooling structure of the blade, why would it necessarily be sized to accept one?

Claim 26 recites, *inter alia*, that "particles entrained in the cooling medium pass through the first section, through the second passage and are discharged through the inspection aperture, while the cooling medium which is relatively free of particles flows through the second section" (emphasis added). In the component of claim 26, dirt particles entrained in the cooling medium are discharged, due to their inertia, through the dust discharge aperture. This discharge occurs due to the flow speed of the cooling medium at the curved flow section of the flow passage and the

arrangement of the dust discharge aperture relative to the curved flow section. The particles, due to their mass and inertia, take the path through the dust discharge aperture and tend not to flow via the deflection into the "second section" of the flow passage and the further course of cooling air. As a result, there is relatively dust-free cooling air available for the further cooling of the component.

However, in *Yamarik et al.'s* rotor blade a portion of the cooling air required to cool the blade is admitted through the forward conduit 40. The cooling air admitted through the forward conduit 40 is mostly directed by the forming vane 54 down into passageway 26 and eventually through the passage 66. A significant portion of the particles entrained in the cooling air would remain on the inside of the turning vane 54 inside the rounded contour at the base 62, where the cooling air turns. Accordingly, applicants submit that the cooling medium that flows through the "second section" of the *Yamarik et al.* coolant flow structure would not be relatively free of particles. Therefore, claim 26 is distinguishable over *Yamarik et al.* for at least this additional reason.

CONCLUSION

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

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